

REMARKS/ARGUMENTS

After the foregoing Amendment, Claims 1-2, 4, 6, 9, 12, 15-16, 19-20, 23-26, 31-32, 35, 37 and 42-54 are currently pending in this application. Claims 3, 5, 7-8, 10-11, 13-14, 17-18, 21-22, 27-30, 33-34, 36, 38-41 and 55-56 have been canceled without prejudice.] Claims 1 and 23 have been amended to specify the feature of the base station having a selectively operable beamforming antenna and configured to determine a relative location of the mobile unit with respect to the beamforming antenna based on information related to the detected sounding pulse and direct a communication beam that encompasses the relative location of the mobile unit, as in former claims 5 and 27. Claims 35 and 48 have been amended to specify the feature of the mobile unit transmitting mobile unit location information associated with the omnidirectional sounding pulse to enable base stations to direct communication beams to the mobile unit, as in former claims 45 and 51. Various amendments have been made to the claims to improve the readability and clarity. The Applicants submit that no new matter has been introduced into the application by these amendments.

Claim Rejections - 35 USC §103

Claims 1, 4, 6, 9, 12, 16, 20, 23, 26, 31, 35, 43, 45, 48-49 and 51 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al. (US Patent No. 6834192) in view of Jollota et al. (US 2004/0142691) further in view of Velazquez et al. (US Patent No. 6,593,880). Claims 2, 24-25, and 37 stand rejected under 35 U.S.C.

§103(a) as being unpatentable over Watanabe et al., Jollota et al. and Velazquez et al. in view of Bark et al. (US Patent No. 6445917). Claims 15, 19, 32, 42, 46-47, 50 and 52-54 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., Jollota et al. and Velazquez et al. in view of Anderson et al. (US Patent No. 5396541). These rejections are respectfully traversed with respect to the amended claims.

The present claims are directed to a method and apparatus for establishing wireless communication of a mobile unit with a base station configured with a beamforming antenna. According to the present claims, the mobile unit emits a sounding pulse detectable by base stations whose coverage area includes the location of the mobile unit, and a base station is selected for wireless communication with the mobile unit from among the base stations that detected the sounding pulse. The selected base station determines the mobile unit location from information related to the detected sounding pulse and operates its beamforming antenna to direct a beam that encompasses the location of the mobile unit when establishing the wireless communication with the mobile unit.

Watanabe et al. teaches a method and apparatus for effectuating a handover in a radio communication system. According to Watanabe et al., the mobile device determines the need for a handover by measuring power levels of signals transmitted by access points (base stations) in its area. The mobile unit sends an INQUIRY message to a selected access point with which it wants to communicate, and the access

responds with address information. Jollota et al. teaches a technique for connection initiation in wireless networks where a mobile unit sends an Inquiry packet, such that nearby base stations that are in an inquiry scan state receive the Inquiry packet from the mobile unit.

As asserted by the Examiner, Watanabe et al. and Jollota et al. do not consider base stations equipped with beamforming antennas where a base station selected for wireless communication with the mobile unit must determine the location of the mobile unit in order to operate its beamforming antenna to direct a beam to the location of the mobile unit. Accordingly, Watanabe et al. and Jollota et al. fail to teach or suggest the features of the present claims of determining at a selected base station a relative location of a mobile unit based on information associated with the detected sounding pulse and establishing wireless communication with the mobile unit by forming a directed a beam toward the determined location of the mobile unit.

Velazquez et al. teaches a wireless communication system employing directive antenna arrays where base stations and mobile units employ position knowledge to direct narrow antenna beams toward desired users. According to Velazquez et al. (see Fig. 8 and Column 6, line 38 to column 7, line 8), following the initial establishment of a wireless link between a mobile unit and a base station, the mobile unit and base station exchange position information over the established wireless link in order to direct beams toward each other. Therefore, Velazquez et al. fails to teach or suggest determining a relative location of the mobile unit based on information related to the

detected sounding pulse as per the present claims.

The present claims enable a selected base station to immediately form a directed beam to the location of the mobile unit prior to establishing wireless communication with the mobile unit by determining the relative location of the mobile unit based on information related to the detected sounding pulse. Velazquez et al. teaches providing location information from a mobile unit to a base station for directing a beamforming antenna, however, this is done after a wireless communication link is established between the base station and the mobile unit. In contrast, the present claims teach providing mobile unit location information with the sounding pulse before a base station has been selected for establishing wireless communication so that the selected base station can determine and direct a beam to the relative location of the mobile unit. The present claims also enable base stations that detect the sounding pulse to direct communication beams to the mobile unit in response to the sounding pulse for the mobile unit to select a base station with which to establish wireless communication, as per claims 35 and 48.

Claim 1 (and similarly claim 23) requires:

...
receiving from the interface notification of selection from among the base stations that detected the sounding pulse for mobile unit communication based on the communicated information;
determining a relative location of the mobile unit with respect to the beamforming antenna of the base station based on information related to the detected sounding pulse; and

directing a communication beam from the base station to the mobile unit to establish wireless communication, whereby the directing of a communication beam includes operating the base station's beamforming antenna to form a communication beam covering a selected portion of the coverage area serviced by the base station that encompasses the relative location of the mobile unit.

As explained above, Watanabe et al., Jollota et al., and Velazquez et al. do not teach the feature of determining at a selected base station a relative location of the mobile unit with respect to the beamforming antenna of the base station based on information related to the detected sounding pulse and directing a communication beam from the base station to the mobile unit to establish wireless communication where the beam covers a selected portion of the coverage area that encompasses the determined relative location of the mobile unit.

Claim 35 (and similarly claim 48) requires:

...
transmitting an omnidirectional sounding pulse from the mobile unit for detection by base stations that have a geographic coverage area that includes a current location of the mobile unit, wherein the transmitting of an omnidirectional sounding pulse includes transmitting of mobile unit location information associated with the sounding pulse to enable base stations to direct communication beams to the mobile unit;
receiving directed communication beams from base stations
detecting the sounding pulse at the mobile unit;
selecting a base station from among the base stations that detected the sounding pulse based on the communication beams received by the mobile unit; and
establishing a wireless communication with the selected base station.

As explained above, Watanabe et al., Jollota et al., and Velazquez et al. do not teach the feature where transmitting of an omnidirectional sounding pulse includes the

transmitting of mobile unit location information associated with the sounding pulse to enable base stations to direct communication beams to the mobile unit.

Based on the explanation given above, Watanabe et al., Jollota et al., and Velazquez et al. do not teach the features of claims 1, 23, 35 and 48. Further references Anderson et al. and Bark et al. also do not correct these deficiencies. Accordingly, the cited references do not teach the features of present independent claims 1, 23, 35 and 48.

Claims 2, 4, 6, 9, 12, 15-16, 19-20, 24-26, 31-32, 37, 42-47, and 49-54 are dependent upon claims 1, 23, 35 and 48 which the Applicants believe are allowable over the cited prior art of record for the same reasons provided above.

Based on the arguments presented above, withdrawal of the 35 U.S.C. 103(a) rejection of claims 1-2, 4, 6, 9, 12, 15-16, 19-20, 23-26, 31-32, 35, 37 and 42-54 is respectfully requested.

Conclusion

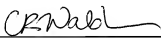
If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully

submit that the present application, including claims 1-2, 4, 6, 9, 12, 15-16, 19-20, 23-26, 31-32, 35, 37 and 42-54, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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